APPARATUS, SYSTEM, AND METHOD FOR ADAPTER FASTLOAD
James C. Chen, et al
IBM Docket No.: TUC9-2003-0129 (JMB)
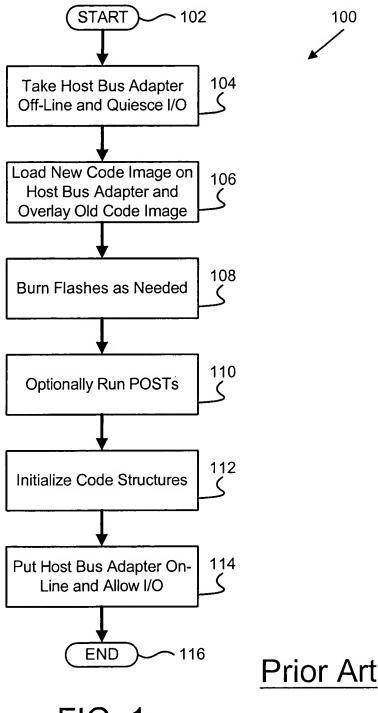Kunzler & Associates Dock t No.: 1500.2.33

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START — 102

100

Take Host Bus Adapter Off-Line and Quiesce I/O — 104

Load New Code Image on Host Bus Adapter and Overlay Old Code Image — 106

Burn Flashes as Needed — 108

Optionally Run POSTs — 110

Initialize Code Structures — 112

Put Host Bus Adapter On-Line and Allow I/O — 114

END — 116

Prior Art

FIG. 1

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Host-1
202

HBA-1a
212a

HBA-1b
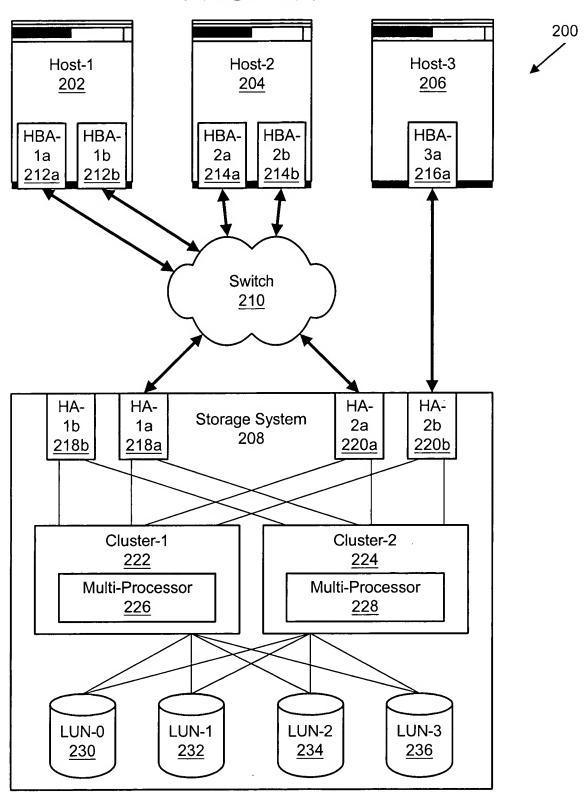212b

Host-2
204

HBA-2a
214a

HBA-2b
214b

Host-3
206

HBA-3a
216a

Switch
210

Storage System
208

HA-1b
218b

HA-1a
218a

HA-2a
220a

HA-2b
220b

Cluster-1
222

Multi-Processor
226

Cluster-2
224

Multi-Processor
228

LUN-0
230

LUN-1
232

LUN-2
234

LUN-3
236

200

FIG. 2

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Host Adapter
300

I/O Port
308

Flash
304

Programmable
Logic Array
306

CPU
302

Memory 310

Old Code
Image
314

New Code
Image
316

Concurrent Code
Load Apparatus
312

Query
Module
318

Image Load
Module
320

Image Bridge
Module
322

Memory
Initialization
Module
324

Image Overlay
Module
326

Fastload Key
Module
328

Standard Adapter
Initialization
Module
330

Fastload Adapter
Initialization
Module
332

FIG. 3

APPARATUS, SYSTEM, AND METHOD FOR ADAPTER FASTLOAD
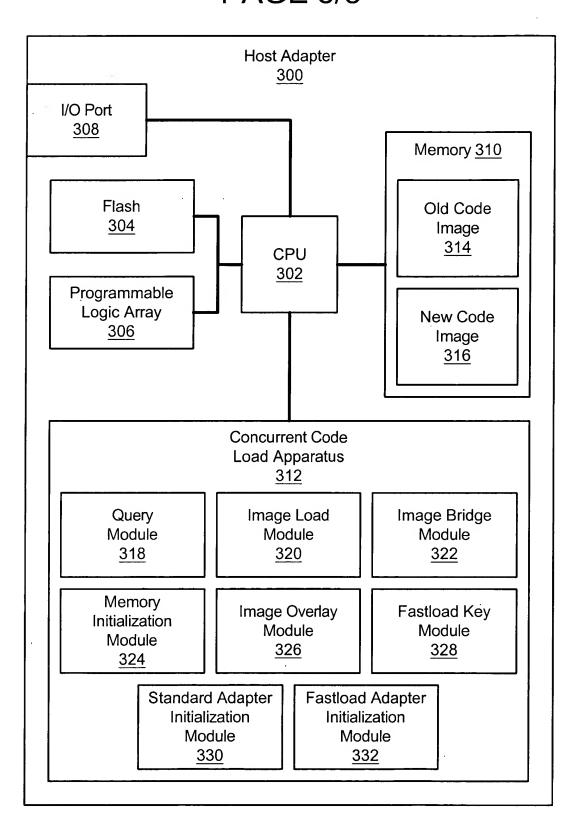James C. Chen, et al
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402 — Metadata   314

404 — Runtime
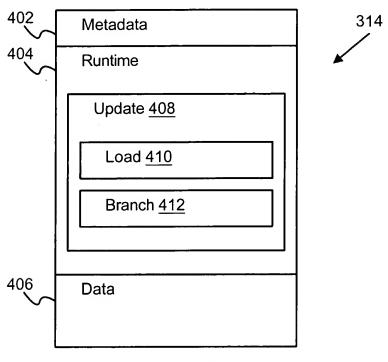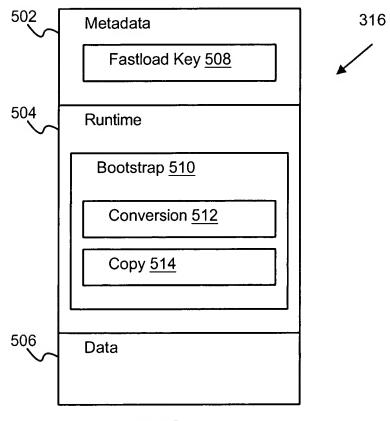
Update 408

Load 410

Branch 412

406 — Data

FIG. 4

502 — Metadata   316

Fastload Key 508

504 — Runtime

Bootstrap 510

Conversion 512

Copy 514

506 — Data

FIG. 5

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START 602

600

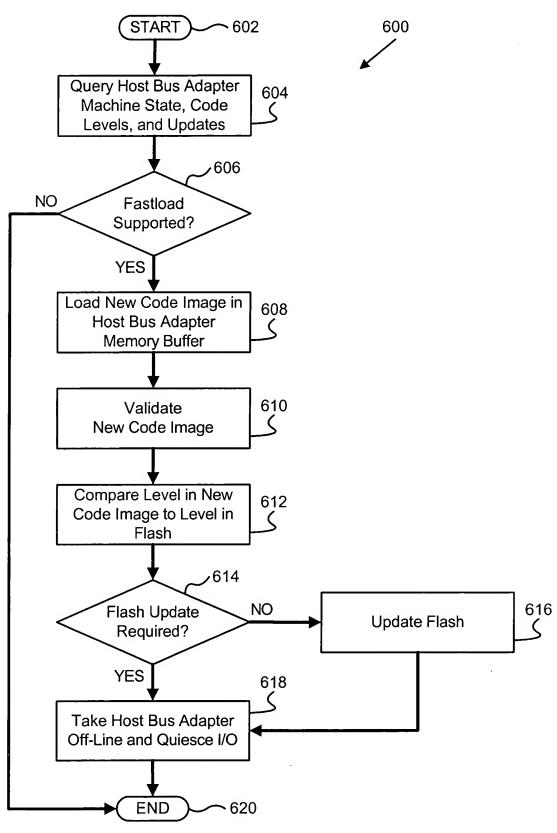Query Host Bus Adapter Machine State, Code Levels, and Updates 604

606

NO — Fastload Supported?

YES

Load New Code Image in Host Bus Adapter Memory Buffer 608

Validate New Code Image 610

Compare Level in New Code Image to Level in Flash 612

614

Flash Update Required? — NO → Update Flash 616

YES

Take Host Bus Adapter Off-Line and Quiesce I/O 618

END 620

FIG. 6

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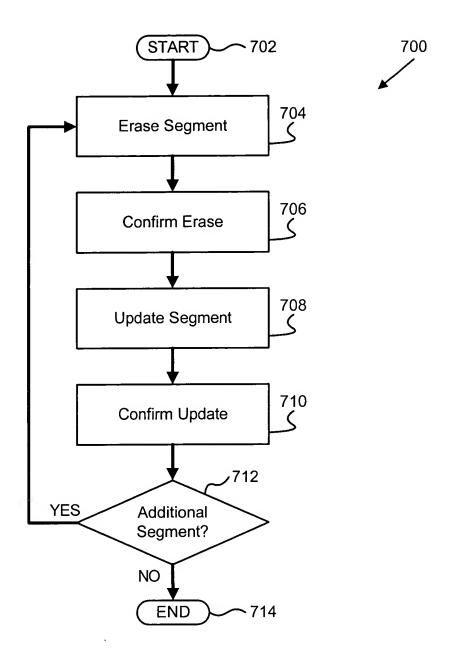Kunzler & Ass ciates Docket No.: 1500.2.33

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START — 702

700

Erase Segment — 704

Confirm Erase — 706

Update Segment — 708

Confirm Update — 710

712

YES — Additional Segment?

NO

END — 714

FIG. 7

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START — 802

800

Locate New Code Image in Host Bus Adapter Memory Buffer — 804

Initialize Memory — 806

Overlay New Code Image on top of Old Code Image — 808

Flush Code Image Data References — 810

Flush Instruction References from Cache — 812

Create and Store Fastload Key — 814
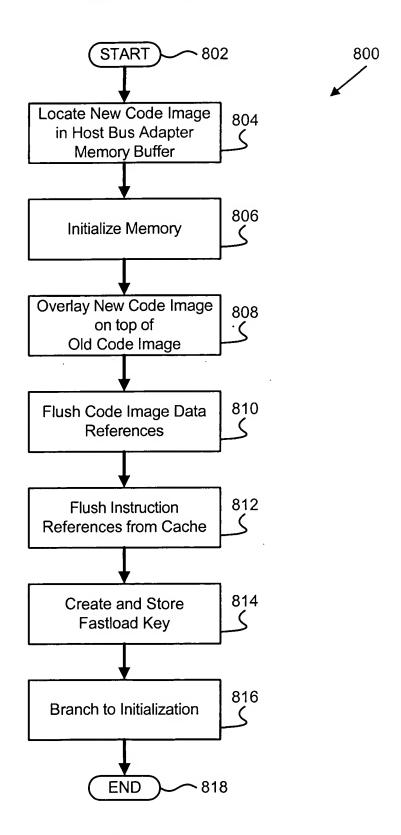
Branch to Initialization — 816

END — 818

FIG. 8

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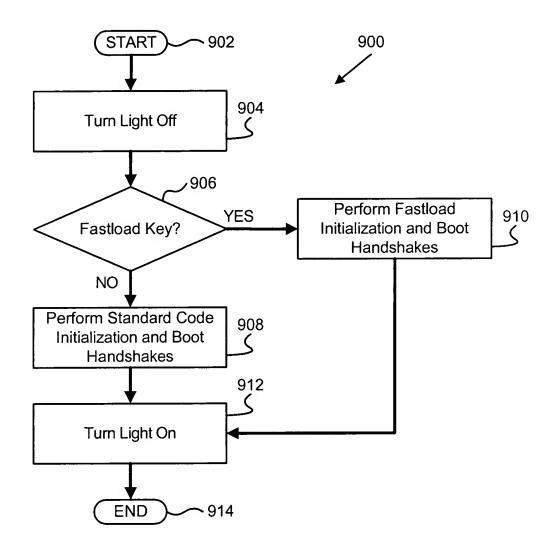Kunzler & Associates Docket No.: 1500.2.33

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START — 902

900

Turn Light Off — 904

Fastload Key? — 906

YES → Perform Fastload Initialization and Boot Handshakes — 910

NO ↓

Perform Standard Code Initialization and Boot Handshakes — 908

Turn Light On — 912

END — 914

FIG. 9